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ABSTRACT

This paper present a case study on how the teaching methods in a number of modules in the Department of Information Science at the University of Pretoria (South Africa) have been transformed from traditional classroom presentations to a learner-centered approach supported by material on the World Wide Web and by e-mail and listserv interaction. The emphasis is on the honors (fourth year) program in Library and Information Science (LIS) and the undergraduate program in multimedia. Problems and successes are pointed out. Included in the discussion are the students' reaction toward these changes (both positive and negative) and the role of the university's library and the subject librarian. The difference in attitude between the multimedia students and LIS students in accepting these changes is demonstrated, and various reasons for this are advanced. In conclusion, a number of proposals are made on how to make these changes more acceptable to all students. Tables compare course outlines, student profiles, teaching methods, AIS (Academic Information Service) support, and student attitudes. (MES)

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Web-supported teaching in the Department of Information Science at the University of Pretoria: a case study

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Paper

1. Introduction

The paper consists of a case study on how the tuition methods in a number of modules in the Department of Information Science at the University of Pretoria have been transformed from traditional classroom presentations to a learner-centered approach supported by material on the web and by e-mail and listserver interaction. The emphasis is on the honours (fourth year) programme in Library and Information Science (LIS) and the under-graduate programme in multimedia. Problems and successes are pointed out. Included in the discussion is the students' reaction towards these changes (positive and negative), and the role of the University's library and the subject librarian. The difference in attitude between the multimedia students and the LIS students in accepting these changes is demonstrated and various reasons for this are advanced. In conclusion a number of proposals are made on how to make these changes more acceptable to all students.

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2. Background to the University of Pretoria

2.1 General profile

The University of Pretoria, situated in Pretoria, the administrative capital city of the Republic of South Africa, is a dynamic institution that applies its energies and resources to fulfil its primary functions of teaching, research and community service. Its core considerations in determining its priorities are internationalisation, diversity (within and among universities and programmes), relevance and quality. Within this context the mission of the University is:

- To be an internationally recognised academic institution which provides teaching, undertakes research and renders community service;
- to fulfil the educational, cultural, social, economic and technological needs of the South African and Southern African communities; and
- to be a member of the international scientific community (Boon, 1999:2; University of Pretoria, 1999:2).

The mission is summarised in the catch-phrase often used by the Principal of the University: "to be internationally competitive and locally relevant".

In order to fulfil this mission the University preserves a healthy balance between the development of market and vocationally oriented teaching programmes that will meet rapidly changing market needs, and the preservation of pure scientific programmes to stimulate postgraduate study and research. Cognisance is also taken of international trends in the higher teaching environment, with the result that emphasis is placed on:

- outcomes-based learning;
- the development of problem-solving skills; and
- the application of multidisciplinary and interdisciplinary approaches.

The University of Pretoria has nine faculties and offers 520 different qualifications. Over the past seven years the student profile has changed considerably. Traditionally the University catered primarily for Afrikaans-speaking white students. However, the nature of the student body has changed and is now multi-cultural. The multi-racial and multi-cultural student population results in a new dynamism, but also poses new challenges. For instance, in the past - up to 1994 - teaching used to be primarily in Afrikaans, but the change in student profile has resulted in the introduction of English as a teaching language in addition to Afrikaans, and in most departments all lectures are repeated in English. Some lectures are presented bilingually, or only in English.The Honours programmes in the Department of Information Science, as in most other departments, are presented primarily in English for the simple reason that it is not cost-effective to repeat lectures for fairly small groups of students.

In 2000 the total number of contact tuition students is approximately 27,600. Since 1995, the University has, for the first time, offered some programmes telematically. In 1999 about 26 000 telematic students were registered at the

University.

The Academic Information Service and the information technology infrastructure of the University play a very important role in enabling and supporting telematic teaching.

2.2 Academic Information Service (Library)

The University's Academic Information Service consists of a main information centre and various off-campus units that address the needs of the clients in specific fields of study, for example Veterinary Science, Medical Science and Music. The Academic Information Service is also a member of the Gauteng Environs Library Consortium (Gaelic), the largest academic consortium in South Africa, consisting of 14 libraries which cooperate in terms of resource sharing and shared cataloguing.

Owing to changing client needs, the Academic Information Service has provided significant momentum to the development of a digital information service for students and staff. Various strategies are being followed, which include:

- The creation of an electronic interface between the University's own databases and commercially available databases. This includes the University's CD-ROM network with a number of SilverPlatter, Dialog and various other databases, as well as an interface to electronic journal collections such as MCB, Kluwer Online and Elsevier's ScienceDirect.

- Development of an academic cyber space where clients are able to surf the Web at a minimal cost.

- The development of a subject-oriented portal for each academic department/subject area. This initiative is under the direction of the subject librarians/information specialists.

- Development of an electronic collection of prescribed materials. After copyright clearance has been granted, full text journal articles and extracts from textbooks are scanned in and stored in pdf format. The material is then made available electronically via the Innopac system and the Explore function of the catalogue. Students enter their student number in order to gain access to the material. Facilities also exist to make hard copies of the electronic material at a minimal fee.

2.3 Information technology infrastructure

Technology is a cross-sectional entity that affects all the functions of the University to a greater or lesser extent and plays a crucial role in its successful operation. Therefore the University endeavours to utilise technology to its fullest extent. It has developed a formal Technology Plan, overseen by a committee at the highest management level which manages the strategic aspects of the technology infrastructure in conjunction with the IT Services Department, which is in charge of all operational aspects.

The University has a very sophisticated ATM computer network on the main campus and the various satellite campuses. More than 40 local area networks, each with its own servers, are connected via the fibre-optic backbone. There is one mainframe computer and a number of UNIX machines, all operated by IT staff as well as academic staff. In addition there is one official web server, as well as a number of departmental web servers and the web server of the virtual

campus.

Extensive computer laboratories have been established for use by students as part of their formal courses. At present there are more than 1600 computers in various laboratories across the campus and satellite campusses. Students of the Department have access to the 460+ computers in the 12 laboratories of the so-called Informatorium of the School of Information Technology, where they attend scheduled practical classes and do practical assignments in their own time. These laboratories are open approximately 14 hours per day, six days per week. Multimedia students in addition have access to the multimedia laboratory of the Department with 17 computers, scanners, a video capture card, digital video and still cameras, a sophisticated sound studio, and a multitude of multimedia software. All honours students in the Department have access to the telematics laboratory, also situated in the Informatorium. All multimedia and honours students in the Department have access to the Internet and e-mail through the various laboratories.

2.4 Telematic education

Telematic education enables students to access teaching programmes and learning materials at a more flexible time, place and pace, and results in many flexible learning opportunities.

Telematic education at the University of Pretoria may be either "pure" distance teaching, or contact teaching supplemented by technology-based teaching. This implies that a student on campus may also be classified as a telematic student if his/her course includes sections that are supported by web-based learning and teaching. Technology-based teaching can be either web-based, or television-based (via the University's dedicated digital satellite TV channel). Distance teaching delivery can be either paper-based, or technology-based, or a combination of both.

Therefore, there are many permutations of "contact vs distance" and "paper-based vs web-based", which results in a complex continuum of teaching methodologies and delivery methods.

To coordinate this complex array of flexi-learn opportunities and programmes at the University a new department, viz the Department of Telematic Education, was established in 1997, renamed at the beginning of 2000 to the Department of Telematic Learning and Education Innovation. (In addition to its involvement in formal teaching programmes Telematic Education also coordinates a number of support classes in especially the natural sciences and mathematics for schools across South Africa via the satellite TV broadcasts).

Web-based telematic teaching provides a continuum of learning possibilities and styles, from fully web-based courses where all material and interaction is solely via the web, to contact teaching where the web is used as a support to facilitate the access to study guides and prescribed articles, as well as for communication between lecturers and students. The latter model is followed by many departments at the University.

With a view to implementing the vision of web-based interactive telematic education and facilitating the development of web-based courses the Virtual Campus project was established in 1998. WebCT (WebCourseTools) was selected as the delivery platform for course content and management. It provides an easy interface to structure course material for web-based delivery, as well as a number of administrative facilities, such as facilities to manage class lists,

marks, submission of assignments, communication through e-mail and bulletin boards. A separate server, viz the Virtual Campus (VC) server, was installed for WebCT and the web-based courses. A number of departments, including the Department of Information Science, make use of different servers for different sections and functions in their courses in addition to the VC server.

As part of the Virtual Campus project, various administrative facilities are provided to students via the University Web server. They can, for instance, apply for registration, display their examination marks, academic record and account status. Various other facilities are being developed, such as full online registration and secure online payment of accounts.

3. Department of Information Science

3.1 General background

Education in Information and Library Science has changed dramatically at the University of Pretoria over the past ten years. Not only has the number of students in Information Science increased fivefold, but the existing course content has been constantly renewed. Three new programmes, specifically aimed at the growing job opportunities in the information industry, have also been established, and a further specialisation option has been approved for implementation in 2001.

The Department of Library and Information Science was founded in 1944. At that stage it offered only the traditional Library Science degree (Bachelor in Library Science). The department officially changed its name in 1990 to the Department of Information Science. During 1998 it became part of the School of Information Technology. The School consists of the Departments of Information Science, Informatics, and Computer Science. Up to the middle of 1999 the Department was part of the Faculty of Humanities. After restructuring at the University of Pretoria, the School of Information Technology, and by implication the Department of Information Science, officially became part of a new faculty which comprises the Schools of Engineering, the Built Environment and Information Technology. Currently there are approximately 1 200 under- and postgraduate students enrolled in the Department, with 16 full-time lecturers.

3.2 Programmes offered by the Department

The Department offers a full complement of under-graduate and post-graduate programmes, viz Bachelors (three years), Honours, Masters (research or coursework) and doctoral programmes. Various specialisation options are available, namely:

- Specialisation in Library Science (the original programme of the Department)
- Specialisation in Information Science (from 1991)
- Specialisation in Publishing (from 1996)
- Specialisation in Multimedia (from 1998)
- A specialisation in Information and Knowledge Management will be

offered from 2001.

As from 2000 all programmes have been renamed as programmes in Information Science, i.e. *Baccalaureus Informationis Scientiae* (B.IS), *Magister Informationis Scientiae* (M.IS), etc., with the various specialisation options given in brackets.

South Africa is a blend of first-world and third-world features. The training in Library and Information Science therefore has to make provision for students who intend working in a high-technology environment. Students who are not interested in technology, but who plan to work at grass-roots level, such as in community information centres in rural areas, are also catered for. Therefore the Department had to build in options in the programmes to satisfy the needs of these diverse groups, as well as any combination of choices in-between. The material is organised in a modular system and each module runs for a period of seven weeks. This modular approach is followed by many institutions and "enables students to 'mix and match' their own subjects according to individual interests, aspirations, and abilities" (MacDougall and Brittain 1993: 374).

For the specialisation options in Publishing, Multimedia and Information and Knowledge Management additional modules have been designed to focus on specific theoretical aspects and practical skills required in industry.

Specified modules in Information Science and/or Library Science form part of the core in each of the programmes in the Department. In each case these core modules are supplemented with compulsory modules and electives from other departments in different schools and faculties. Details of the various programmes and modules are available in Bothma and Britz 2000 and at http://is.up.ac.za/courses/.

Undergraduate programmes are all presented through contact tuition, supplemented to a greater or lesser degree by web-based telematic teaching. The same applies to the Honours programmes, even though there is a web-based distance education option. Masters and doctoral students are all part-time, and are scattered throughout the country and even Southern Africa.

From 2000, all the courses at the university are based on outcomes-based education, which can be directly linked to a new Education and Training dispensation in South Africa. This model is a paradigm shift from traditional training because there is a movement away from content-driven and teacher/trainer-centred education towards a learner-driven model aiming at achieving specific outcomes and lifelong learning. In this process the teacher/trainer becomes primarily a facilitator by stimulating creativity, self learning and critical thinking. Olivier (1998) indicated that, with outcomes-based education and training, learning achievements are more tangible and the results thereof can be validated against real world requirements.

3.3 Honours in Library and Information Science

Two honours courses in Library and Information Science are currently presented by the Department of Information Science, namely the B.IS (Hons) in Information Science and the B.IS (Hons) in Library Science (in addition to the honours in Publishing since 1996, and the honours in Multimedia which will start in 2001). The honours courses aim to provide students with the opportunity to develop independent and critical thinking skills, while at the same time bridging the gap between undergraduate and post-graduate study. The duration of the courses is one year full-time study or two years part-time study.

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3.3.1 Course outline

As a result of the aims set for the course, it has been compiled to provide students with the opportunity of specialising. Students have to choose four subjects from a total of eight speciality subjects. These speciality subjects are:

- Information management
- Information retrieval
- Multimedia
- Information philosophy, law and ethics
- Information users and information user behaviour
- Management of information service organisations
- Information service provision
- Information for development

The course does not only focus on gaining subject knowledge, but also on research techniques. A subject, Research Methodology, in which students are exposed to both qualitative and quantitative research techniques, is compulsory for all honours students. With this compulsory subject as well as the opportunity to specialise in specific subject fields, a sound basis is developed for further studies on masters and doctoral levels.

Details about the course content are available at at http://is.up.ac.za/courses/honours/.

3.3.2 Student profile

The student core consists of:

- Graduates of our own Department
- Graduates of other South African universities - including students from the previously disadvantaged universities
- Experienced people from the industry who did not follow any form of formal study for some time.

In order to be admitted to the honours courses a student must have achieved an average of 60% in the undergraduate studies. Unfortunately the academic standard among institutions in South Africa is not consistent - a student who obtained 60% at one university will not necessarily achieve the same mark at another university with a higher standard.

Another prerequisite for admission to the honours courses is access to the Internet and e-mail facilities. The reason for this is that all correspondence between students and lecturers should take place via e-mail and all documentation will be provided on the Internet only.

3.3.3 Teaching methods

Students have the choice whether they want to follow the course on-campus or via telematic tuition. On-campus tuition consists of lecture room interaction. Telematic tuition consists of the integration of contact tuition, paper-based distance education and electronic discussions via e-mail or discussion groups. Ten discussions per subject are scheduled for the academic year for the period February to November. Guest lecturers from industry present lectures on

relevant topics. It is expected of all students to prepare themselves properly and to participate actively in the discussions, whether it is on-campus or telematically.

The structure for each lecture/discussion as well as a bibliography is provided beforehand to students on the Department's web site. Except for the study material which students need to purchase, all prescribed journal articles and extracts from textbooks are made available to students via the electronic facilities of the Academic Information Service. URLs to existing articles on the web are also provided to students. It is expected of students to read through the prescribed material and to prepare themselves properly for each lecture/discussion.

It is also expected of students to be in regular electronic contact with their lecturers and to communicate any study problems via e-mail.

Apart from the discussions and less comprehensive assignments, one mini-thesis per subject on an approved topic, must be submitted as well. The final evaluation is a written examination.

Despite all the facilities available to students, it is found that a number of students:

- do not have e-mail or access to Internet facilities;
- do not purchase the prescribed study material;
- do not prepare themselves properly for discussions; and
- do not participate in classroom or electronic discussions.

This causes immense frustration among lecturers who, over and above a heavy workload, put in a great effort to make the material available to students. Students who do prepare themselves properly are also frustrated because they cannot get the full benefit of the discussions.

3.4 Multimedia

The programme in Multimedia started in 1998, and this year the group of students will graduate. In addition to the multimedia-related modules students, students have to take Computer Science up to third year level, Visual Design and a language of their choice up to second year level, and one year courses in Visual Communication and Business Management, as well as a few so-called fundamental modules in Information Literacy, Academic Skills and Research Methodology.

The programme is very popular. In the first year it was offered, 42 students enrolled, and has grown to 75 students in the first year class. However, it seems to be a very difficult course as well, since approximately 50% of students drop out by the middle of the second year. Those that remain are very determined to complete their studies.

3.4.1 Course outline

The multimedia modules offered by the Department of Information Science cover theoretical as well as practical aspects of multimedia. Students study inter alia the following as part of their theoretical work:

- An introduction to Information Science in general, the place of the multimedia developer in the information life cycle, information technology and media studies.
- Multimedia software and hardware.
- The theory, history and application areas of hypermedia and multimedia.
- Information organisation and information architecture.
- Multimedia project development and management.
- The theory and practice of markup languages (HTML, CSS, XML, XSL, SGML).
- Human-computer interaction, interface design and usability engineering.

Details about the curriculum are available at http://is.up.ac.za/multimedia/.

As part of their practical work students have to develop web sites in which they have to indicate that they have mastered all the technologies involved. This includes all basic HTML 4 functionalities and style sheets (CSS), as well as multimedia on the web, such as images (Photoshop), animation (Flash), sound (WaveStudio) and video (Adobe Premier) at first year level. During the second year they do an in-depth study of XML and XSL, as well as ASP and ODBC for web databases and search engines. During their second and third year students also have to do projects in programmes such as Toolbook, Authorware Professional and Macromedia Director, as well as a number of other software packages.

3.4.2 Student profile

Entrance requirements for the programme are fairly high. Computer Studies at school level as well as Mathematics (both at higher grade) are prerequisites. However, a bridging programme, which lengthens the programme from three to four years is available for students that don't comply with the entrance requirements.

The student body is fairly diverset, in that some students are more inclined toward programming, and some more toward the design aspects of multimedia. A fairly high level of computer literacy is assumed at the start of the first year, and basic programming skills in especially Java are assumed at the start of the second year. The practicals of some of the multimedia modules rely very heavily on programming skills acquired in the Computer Science modules. This sometimes causes frustration amongst students (and lecturers), since their progress in acquiring the necessary programming skills sometimes lags behind their progress in the multimedia modules.

Students manage to master the theoretical sections of the multimedia modules fairly easily, but tend to struggle with the practicals. This is mainly due to the fact that students very often lack the ability to integrate their knowledge from modules outside of the Department with what they are taught within the Department. Both their design skills (taught by the Department of Visual Arts in the Visual Design modules) and their programming skills (taught by the Department of Computer Science) are essential for the practical development of multimedia products.

Most students tend to have their own computers with Internet access at home by the end of their first year of study. They also have access to departmental computers facilities, viz a multimedia laboratory with scanners, digital video cameras, video digitising facilities and a sound studio, as well as internet access.

3.4.3 Teaching methods

Teaching in the theoretical aspects of multimedia tends to be a combination of traditional "talk and chalk" and more interactive flexi-learn where students have to take part in discussion classes and do presentations. In the practicals we tend to encourage students to learn through a process of discovery, experimentation and problem solving, rather than trying to teach them "button-press skills". Students are given a very brief introduction to a specific topic, and are then pointed to extensive sources on the web, which they must consult in order to do a specific practical assignment. The rationale behind this is that problem-solving skills and the ability to teach oneself new technologies are essential for survival in the very fast developing field of multimedia and web technologies.

All study guides and project briefs are placed on the departmental intranet. As far as possible all prescribed articles are also placed on the departmental intranet (password protected) once copyright has been cleared. A portal for web technologies is constantly expanded. Students have to submit all practical assignments via the experimental departmental web server.

Communication with students is electronic as far as possible. E-mail to individual students or lecturers occurs quite often, but most e-mail is distributed via listservers to the whole group. There are listservers for each of the three different year groups. Students and lecturers tend to use these listservers very actively. From the lecturers' side they are used to communicate any administrative arrangements that have to be brought to the attention of the class, feedback on tests and assignments, and interesting snippets about developments in the general field of multimedia. Students tend to use the listservers for general correspondence that they perceive affects their whole group, for example discussions about test or examination dates, enquiries about project briefs and general complaints (about, for instance, computer facilities), as well as, occasionally, more "social" correspondence (encouragement before a test, best wishes for a holiday or festive season, etc.). Students have also set up private listservers to which lecturers don't have access.

The teaching methods are in line with the University's policy of education innovation which encourages flexi-learn, student-centered learning and lifelong learning (Brown 1999). Student participation in class discussions and the quality of their presentations are not always on a level we would like. Unfortunately this sometimes results in a return to the "talk and chalk" method of teaching. Motivating students continually to prepare properly for discussion classes and presentations is extremely difficult.

4. Comparison between the honours (Information Science and Library Science) and multimedia programmes

The two web-supported courses are compared regarding course outline, student profile, teaching methods, IT support, AIS support and the attitude of the students. Based on the findings, the necessary recommendations for the improvement of both courses are made.

Table 1: Course outline

Honours (Library and Information Science)	**Multimedia**
Course content keeps track with the latest developments in the field and market needs in a Southern African context.	Course content keeps track with the latest developments in the field and market needs in a Southern African context.
Course addresses a range from high tech to grass roots levels.	Only high tech is addressed.
Focus is on the narrower fields of Information and Library Science.	Focus is inter- and multi-disciplinary.
Mostly theoretical work, with limited practical exposure.	Approximately equal time is devoted to theory and practicals.
Each elective is a full year course; the full course is one year full-time or two years part-time.	Each elective is a seven week module. The full course is three years full-time. No part-time option is offered.

Table 2: Student profile

Honours (Library and Information Science)	**Multimedia**
Multi-racial and multi-cultural students.	Multi-racial and multi-cultural students, but predominantly from non-disadvantaged backgrounds.
Diverse academic background and job-related experience.	All students are school leavers.
Entrance requirements fairly high (60%).	High entrance requirements due to Computer Science and Mathematics prerequisites.
Vastly different levels of computer skills.	High level of computer skills.
Limited computer ownership and internet access, often only at the office or at the university.	Usually own computer with internet access at home.
Vastly different levels of communication and writing skills in English and/or Afrikaans since these languages are very often the third (or even fourth) language of the student.	Fairly homogenous levels of communication and writing skills in English and/or Afrikaans.

Table 3: Teaching methods

Honours (Library and Information Science)	**Multimedia**
Outcomes-based.	Outcomes-based.
Lecturer is a facilitator (ideally), but often has to fall back on traditional "talk and chalk".	Lecturer is a facilitator (ideally), but often has to fall back on traditional "talk and chalk".
Deepening of theoretical knowledge, with a possibility of application in a student's own working situation.	Deepening of theoretical knowledge, with a possibility of application in an artificial environment.
Each student's individual working situation determines the level of experiential training.	Experiential training, especially in the practicals.
Distance teaching and/or contact.	Only contact teaching.
Courses are presented only after hours to accommodate working students.	Courses are presented only full-time.
Courses presented only in English, but accommodate Afrikaans speaking students.	Courses presented only in English, but accommodate Afrikaans speaking students.
Many aspects of the course are handled telematically	Many aspects of the course are handled telematically
Flexi-learn is encouraged.	Flexi-learn is encouraged.
Many guest lecturers from industry are involved in presenting lectures in order to combine theory and practice.	Limited number of guest lecturers from industry is involved in presenting lectures.
Regular electronic contact with lecturers is encouraged.	Regular electronic contact with lecturers is encouraged.
Study material is made available electronically.	Study material is made available electronically.

Table 4: IT support

Honours (Library and Information Science)	**Multimedia**
Access to departmental laboratory and telematics laboratory, which is problematical for working students.	Multimedia laboratory to satisfy specific needs.
Students rely heavily on their own company IT support to solve problems.	IT support provided by the University.
Fairly high level of IT support needed by some students.	Limited IT support needed due to high level of computer literacy.

Table 5: AIS support

Honours (Library and Information Science)	**Multimedia**
Very good support from library (AIS) personnel.	Very good support from library (AIS) personnel. However, the support is used minimally.
Electronic availability of information is very good.	Electronic availability of information is very good.
Articles scanned in and made available on AIS servers which could result in a time delay.	Articles scanned in by departmental personnel and made available immediately on departmental servers.

Table 6: Attitude

Honours (Library and Information Science)	**Multimedia**
Students in general fairly enthusiastic. They enjoy the new teaching paradigms that enhance problem-solving and critical thinking skills.	Students in general fairly enthusiastic. They enjoy the new teaching paradigms that enhance problem-solving and critical thinking skills.
Students tend to lack the ability to integrate knowledge and skills obtained from different modules.	Students tend to lack the ability to integrate knowledge and skills obtained from different modules.
Hesitant to use technology due to lack of general exposure at earlier levels.	Eager to experiment with new technologies.
Although all necessary facilities are available, they are under-utilised by most students.	Facilities are well-utilised, and there are many demands to upgrade and provide the latest technologies.
Students don't buy prescribed books.	Students tend to buy (or illegally photocopy) prescribed books.
Students don't prepare properly for discussion classes, although the material is available well in advance.	Depending on workload students tend to prepare fairly well for discussion classes.
Students don't participate in adequately in classroom or electronic discussions.	Students participate in class and electronic discussions.
Lack of proper time planning and management, due to work and family commitments.	· Often lack of proper time planning and management, due to student life.

Both courses meet rapidly changing needs of industry and stimulate the development of problem solving skills. Both courses make use of the latest technologies in terms of the course requirements, and receive support from the University's IT services and the AIS. Personnel within the Department are enthusiastic and support all new developments. Teaching methods in the two courses are comparable, and in line with the University's policy of teaching innovation. Lecturers experiment on a regular basis with new teaching methods. Student profiles differ in the two courses due to the nature of the course content and the composition of the student groups. Student attitudes are fairly similar in terms of general attitudes and acceptance of new teaching paradigms. However, there is a vast difference in their attitude towards and acceptance of the place and value of information technology in their curriculum, as well as the role of information technology in their future careers. The multimedia students are much more demanding in terms of being exposed to latest technologies and their expectations from their lecturers. Multimedia students are more exposed to practical work in addition to their theoretical components, and experiential learning forms an essential part of acquiring practical skills.

5. Recommendations

Based on our experience and evaluation of student profiles and attitudes, the following is recommended:

- Research should be done on how to enhance intrinsic and extrinsic motivation, since lack of motivation seems to be the fundamental problem in all cases.
- In the case of the honours the attitude of students towards information technology should be improved by means of *inter alia* -
    - Additional exposure at undergraduate level; and
    - special training sessions for students from other universities, as well as bridging courses for our own students.
- Presenting value-added courses such as time management, study methods, communication and language skills.
- Encouraging lecturers to experiment with problem-solving teaching techniques.
- Encouraging lecturers to have backup plans for innovative teaching methods if students have not prepared properly for a discussion class, so that they do not have to fall back on "chalk and talk".
- Encouraging all lecturers to become more enthusiastic about the use and possibilities of information technology to positively influence the attitude of students.
- Industry participation in lecturing should point out the essential role of information technology for the modern information professional.
- Encouraging independent thinking skills so that students will be able to voice their own opinions - in the classroom situation as well as electronically - based on a solid understanding of the subject matter.
- Encouraging students to integrate and apply knowledge from the various modules and subject areas in order to obtain a holistic view of the environent in which they operate or are going to operate.

6. Conclusion

We accept that many of the problems listed are fairly universal. Some problems, however, are unique to the South African context owing to the inequalities of the past, problems related to second and third language tuition and a lack of a learning culture as a result of the school system.

Some students lack a general commitment to their studies and the intrinsic motivation to complete their studies successfully. Informal discussions with colleagues at other universities in South Africa have confirmed that this is a general phenomenon, also in other fields of study. Commitment or lack of commitment is not race- or gender-dependent. Many students from historically

disadvantaged communities utilise all opportunities presented by the University and the Department, and are committed to their studies.

Even though we have listed a number of serious problems, our students in general perform very well academically, and they are in high demand in industry.

Through the students that are delivered by the Department the vision and mission of the University are fulfilled. Owing to constant curriculum revision based on the latest developments in and needs of industry we stay relevant and our students can meet the requirements of the job market. Our course content and programmes are unique in the Southern African context and compare favourably with the best international schools of Information Science. The Department has recently been reviewed and evaluated by an international panel and we received a very favourable report.

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